A NEW SPECIES OF *AMBRYSUS* FROM DEATH VALLEY, WITH NOTES ON THE GENUS IN THE UNITED STATES (HEMIPTERA: NAUCORIDÆ)

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NAUCORIDÆ (Fallen) 1814

AMBRYSINÆ Usinger 1941

Ambrysus Stål 1862

Ambrysus funebris sp. nov.

General appearance: the smallest, most compact species known to me—size 6.0-6.5 mm. long and 3.5 mm. wide. Dorsum conspicuously lighter anteriorly than posteriorly, unmottled, shiny. Venter deep yellowish with conspicuous darkening centrally.

Head: smooth, shiny, minutely punctulate. Color light yellowish in anterior two-thirds, brownish in posterior portion behind eyes; two unequally spaced dark, blackish sinuosities occupy centrum, and between them, the very faint line of light brownish dots, increasing in size posteriorly, so characteristic an *Ambrysus* pattern, is barely discernible, fusing with the brownish posterior portion of head (which latter represents the "bilobed" basal spot of other species); some darkening at anterior margin of head also. When oriented so that dorsal plane is perpendicular to line-of-vision (i.e., the greatest amount of dorsum exposed to view), front of head is seen to be slightly protuberant before eyes, and distinctly truncate. Eyes coal-black; outer margin slightly curved, inner margin straight, posterior margin strongly curved; viewed posteriorly, eyes very distinctly, but not exceptionally strongly, protuberant above general head surface, the point of juncture forming a prominent sinuosity. Head broadly and deeply set into anterior pronotal border. Labrum same color as front of head; ratio of length-to-width, 15::29 (50%); mouthparts darkening at tip.

Head ratios are:

1) total length to width (including eyes), 75::107 (70%);

2) anterior distance between eyes to posterior distance, 51::72 (71%);

3) posterior distance between eyes to greatest length of head posterior to this line, 72::28 (39%).

Pronotum: shiny, smooth, minutely punctulate with incipient transverse rugulosities developing centrally behind region of deepest head penetration. Color whitish-yellow laterally and posteriorly, brownish on disc with some brownish dotting laterally; central "V"-shaped area still detectable, with remnants of the two large, oblong brownish spots so characteristic of the *Ambrysus* pattern; thin, blackish, posterior, transverse pronotal line very distinct, separating the darker disc from the whitish, broad posterior pronotal border; two blackish, semi-lunar spots present in antero-lateral area of pronotal disc. Lateral pronotal margins smooth, unserrate, but rather conspicuously, although sparsely, pilose. Per cent of lateral curvature, expressed in terms of straight-line distance between anterior and posterior lateral angles and greatest vertical distance between this base line and line-of-curvature, is 16% (102::16). Postero-lateral angles well-rounded. Venter generally yellowish-brown, lightening laterally, with some darkening medially and along posterior border; conspicuous pilosity along posterior margin and on keel.

Dorsal pronotal ratios are:

1) width between anterior angles to greatest pronotal width, 70::118 (59%);

2) median length to greatest width, 44::118 (37%);

3) width between anterior angles to distance between anterior angle and posterior base of pronotum, 70::67 (96%).

Scutellum: dark brownish-black with some lightening laterally. Shiny but not polished, shagreened with dense, shallow punctation, each puncture the seat of a white spot. In normal position, i.e., approximately on a plane surface with remainder of body, ratio of three side, anterior and two laterals, is 114::80::79.

Hemelytra: brownish-black with some vague, diffuse lightening to brownish at posterior end of clavus, and behind embolium, which latter bears the only light yellow spotting of the entire pattern. Surface shiny but not polished, shagreened as is scutellum. Embolium approximately of average proportions for the genus (length-to-width, 102::32=32%; the proportions of embolium in this species are difficult to judge, since the posterior bordering line, usually well-developed, is nearly absent, and the caudal limits must be approximated by the position of the wing sinuosity which usually marks the lateral terminus of the line), sparse but conspicuous marginal pilosity present; anterior three-fourths light yellow, posterior one-fourth and inner emboliar edge for most of its distance brownish. Hemelytra rather weakly exposing lateral connexival margins, which are light yellow with some darkening at connexival junctures; marginal pilosity conspicuous. Postero-

lateral connexival angles non-spinose, but slightly angulate-produced in posterior segments. Hemelytra not quite attaining abdominal tip.

Venter: the prothoracic venter has been discussed above. Remainder of venter yellow-brown, abdomen covered with dense, short, golden hydrofuge pelt, largely lacking over meso- and metasterna; mesosternum with blackish along anterior border and centrally. Emboliar venter distinctly longitudinally bicolored, whitish exteriorly, yellowish interiorly. Connexival postero-lateral angles completely non-spinose, and developing in size and angulosity from anterior-to-posterior; angles of segment I quite completely smoothed into the general body marginal contour; angles of II minutely and shortly, bluntly, angulate-produced, hardly breaking out of the general smoothness of the lateral contour; angles of II distinctly and more strongly, but still bluntly, angulate-produced, while angles of IV are the ultimate in size and angulosity (in the ♂ ; angle V is largest in the ♀), but still not greatly larger than III. Connexival margins smooth, unserrate; borders about medium in width, subparallel over most of their lengths. Female subgenital plate simply and moderately concave at apex. Male genital process entirely lacking.

Legs: (prolegs)—coxa elongate, somewhat angularly globular, whitish-yellow, smooth, flattened to receive heel of femur, distal edges distinctly darker. Trochanter well-developed, smooth, shiny, same color as coxa, with a tuft of hairs distally on anterior end. Femur smooth, whitish-yellow, polished, widest near proximal end, narrowing rapidly to distal end (i.e., with the characteristic swollen, incrassate appearance), compressed dorso-ventrally, with typical short, dense mat of hair along front border which serves as a resting groove for tibia when closed against femur; ratio of length to greatest width of ventral surface is 97::59 (61%). Tibia long, slender, smooth, deep amber, darkening apically, curved most strongly in distal part where, with the single tarsal segment, it forms a continuous curved, grasping instrument—combined tibia + tarsus, when closed, distinctly and strongly exceeding adjacent (proximal) end of femur. Tarsus darkening at tip.

(Mesolegs)—coxa long, somewhat angularly globular, yellowish, equipped with short, dense pile, slightly curved from posterior end weakly to anterior end, the outer face flat for reception of basal part of femur. Trochanter large, distinct, same color as coxa, smooth distally, pilose proximally. Femur long, narrow, whitish-yellow, compressed dorso-ventrally, weak and sparse setulosity on outer or anterior edge; a row of short, reddish chitinous points on dorso-internal (dorso-posterior) margin—ratio of length to median width of ventral surface is 90::17 (19%), length 1.40 mm. Tibia same color as femur, smooth, shiny, long, narrow,

bristling with yellowish and reddish spines arranged in four longitudinal rows representing the four weak "corners" of tibia; ventro-internal (ventro--posterior) row of spines consisting of strong reddish spines alternating with weak yellow spines (rather than the usual condition for the genus in which single spines alternate with short rows of transverse spines along this border); distal end ventrally with two prominent, transverse rows of spines, the terminal row set solidly across tibial apex, the secondary or proximal row essentially complete to outer or anterior edge—ratio of length to median width of ventral surface is 76::8 (11%), length 1.25 mm. Tarsus smooth, long, narrow, whitish-yellow at base, blackening toward tip, pilose and setulose ventrally; two-segmented, terminating in two slender, amber claws, darkening at tips and rather strongly curved.

(Metalegs)—coxa swollen, globular, whitish-yellow, well-furred with short, dense pile, flattened ventro-laterally for reception of basal part of femur. Trochanter well-developed, same color as coxa, pilose proximally, smooth and shiny distally. Femur long, narrow, smooth, whitish-yellow, dorso-ventrally compressed; prominent, short, reddish spination on outer (anterior) margin; inner (posterior) margin with a row of reddish chitinous points dorsally and ventrally, the latter accompanied, and rather obscured, by a row of dense, short pile—ratio of length to median width is 108::19 (18%), length 1.75 mm. Tibia long, narrow, shiny, same color as femur, armed with four rows of reddish spines, the rows more-or-less equally spaced about tibial circumference; a mat of dense, long hairs occupying inner (posterior) face—distal end ventrally with two prominent, transverse rows of spines, the terminal row set solidly across tibial apex, the secondary or proximal row essentially complete to outer or anterior edge—ratio of length to median width of ventral surface, is 123::13 (11%), length 2.0 mm. Tarsus smooth, long, whitish at base, blackening toward tip; two-segmented, spinose and pilose ventrally, terminating in two slender, amber claws, darkening at tips and rather strongly curved.

Type locality data: California—Death Valley (Inyo County) (Cow Creek, 3 mi. E. Death Valley National Monument Winter Headquarters (Funeral Range), 4(iii)48, R. Coleman;[1] 19(vi)48, LaR & Coleman, el. approx, 1,000 ft.).

Disposition of types: Holotype male (No. 5946), allotype (No. 5947) and four paratypes in California Academy of Sciences, San Francisco; paratypes in the collections of Robert L. Usinger (Berkeley, California); Snow Museum, University of

[1] I am indebted to Mr. Richard Coleman, of San Francisco, an assiduous collector, for the first specimen ever taken of this species, as well as for aid in procuring the subsequent large series upon which the description is based.

Kansas, Lawrence; U. S. National Museum, Washington, D. C.; American Museum of Natural History, New York City; British Museum (Natural History), London; Paris Museum, Paris; Death Valley National Monument, California; and the writer (Reno, Nevada).

Ecologic data: A. funebris is known only from the type locality, Cow Creek, which is a short, narrow, rather swift, warm, slightly mineralized stream originating in the western foothills of the Funeral Range on the eastern side of Death Valley. Its point of origin is on a low plateau overlooking the Navares' place three miles east of the valley floor, and consists of several small springs which converge into a single stream which then descends the 45° travertine slope and flows swiftly in a straight line for approximately a hundred yards and is ultimately channeled into a pipe line for the Death Valley National Monument Winter Headquarters three miles below. *Ambrysus funebris* was found only between the base of the low travertine slope and the Navares' cabin nearly a hundred yards downstream, and in suitable spots, very abundantly. Collecting made it immediately apparent that the species was quite particular in its preferences, occurring in only one of the three distinct bottom types prevalent in the stream. Where the stream flow was swift enough to keep the bottom swept clear of sand and coarse gravel fragments, or slow enough to allow an accumulation of fine sand, *A. funebris* was absent—only where the flow was intermediate, strong enough to eliminate sand but too weak to move coarse gravel, was the species found, and then in large numbers, crawling about among the gravel. They are tenacious crawlers, and seem little troubled by the comparatively swift water; although they swim readily in still water (when kept in an aquarium), they seemed never to swim in Cow Creek, being helpless against the flow of water, but depended entirely upon crawling to move about.

The vast majority of the sixty-odd specimens collected were adults, only a few immatures coming to hand.

Water temperature, in the region inhabited by the species, varied from 36°C to 35.5°C, being 40° at the source on the nearby plateau. Associate animals seemed few in variety, but considerable in numbers and consisted chiefly of gomphines and coenagrines. Taken commonly along shore was the gelastocorid *Mononyx fuscipes* Guerin 1843.

This peculiar little *Ambrysus,* the smallest of the genus in the United States, may be compared with such species occurring around it and with which it might conceivably be confused, by the following key:

1. Lateral (connexival) edges of abdominal segments III-IV uniformly and distinctly serrate in contrast to the absolutely smooth edges of segments I-II.....*pudicus* Stål 1862

———Abdominal edges not as above; if serrate, the serration is gradually developed anteriorly-to-posteriorly.....2

2 (1). Male completely lacking a genital process[2] (female with tip of subgenital plate simply concave).....*funebris* sp. nov.

———Male always with a well-developed genital process.....3

3 (2). Tip of female subgenital plate dominantly concave, either simply or complexly so.....*mormon* Montandon 1909

———Subgenital plate apically more-or-less truncate-to-multisinuate, but never with a dominant concavity.....4

4 (3). Female subgenital plate strongly trifid at apex, the lateral angles sharp, the central "angle" or process more rounded; male genital process comparatively sharply right-angulate, narrowing to tip .....*woodburyi* Usinger 1946

———Female subgenital plate either truncate or quadrisinuate apically; male process not suggestively right-angulate.....5

5 (4). Postero-lateral connexival angles non-spinose, merely somewhat angulate-produced.....*californicus* Montandon 1897

———Postero-lateral connexival angles strongly and conspicuously spined .....*bohartorum* Usinger 1946

Such other species as *A. puncticollis, A. melanopterus, A. guttatipennis* and *A. signoreti,* which have been recorded from Arizona and southern California, are large and generally robust, no individuals of which, to my knowledge, are ever less than 10 mm. in length. *A. mormon,* the most variable and widespread species, is generally quite large and robust, but some of its thermally-adapted ecads (such as *A. m. heidemanni* Montandon 1910), may become reduced to 8 mm. in size. Very small individuals of *A. californicus* bear the closest superficial resemblance to *A. funebris,* but are easily separated on structural characters. *A. pudicus* very probably does not occur within the immediate area surrounding *A. funebris,* indications now being that United States records for the former species are erroneous. With *A. pudicus* probably eliminated from the picture, *A. funebris* stands apart sharply from all known United States *Ambrysi* as being the only species in which the male genital process is completely lacking, its point of origin being merely a rounded angle.

The early literature on *Ambrysus* in our northern quarter-sphere is replete with misidentifications. The eminent American hemipterist, Uhler, is the source of most of these early records, and it is evident that his conception of *Ambrysus* was quite at variance with what we now know of the group.[3] Such is attested

[2]The male genital process is a thin chitinous flap arising, when present, on the caudal edge of tergite,V, slightly to the right of the median line.

[3]An interesting sidelight on the early conception of the Naucoridæ is evidenced by Uhler's use of this family name for the belostomatidæ *Abedus ovatus* and *Belostoma fusciventris* (then in *Zaitha*) (1875).

by his recording of *A. pudicus* from Baja California, where it has never since been found; there is little doubt he was confusing *A. pudicus* with the then undescribed *A. hungerfordi* Usinger 1946 which is quite distinct as we recognize it today, even though superficially resembling *A. pudicus.*

The United States *Ambrysi* are, rather peculiarly, restricted to the western, mountainous half of the country, giving way to *Pelocoris* in the East. After entering Texas from Mexico, the easternmost known records of *Ambrysus* are from the vicinity of the Balcones Escarpment on the south and east face of the Edwards Plateau, and no records are known from the flat, semi-tropical environs between the escarpment and the Gulf of Mexico, an area presumably dominated by *Pelocoris.* The latter then swings east and north to cover the United States east of the Rockies. The finding of a single new species of *Pelocoris* from the Great Basin (La Rivers MS), over a thousand miles west of its nearest known relatives, does not invalidate the East-*Pelocoris,* West-*Ambrysus* concept since no *Ambrysi* seem to occur beyond the mountainous West.

The tropical nature of the genus is hardly in doubt on the basis of its present preferences and population and species climaxes, and it can be suspected that low temperatures may be the limiting factor in its northward spread, particularly in view of the facts that (1) the northernmost record (Yellowstone) is from thermal waters, and that (2) the most widely distributed species, *A. mormon,* found from the Rockies to the Pacific (from northern California to southwestern South Dakota and south to southern California, Arizona and New Mexico), from nearly sea level to approximately 8,000 feet in elevation and in waters varying from swift, pure mountain streams to quiet, brackish lake waters, is an extremely variable species with two recognized subspecies and numerous un-named ecads. The significance of *A. mormon* in this respect lies in the fact that, as the most variable species, it is also the one which has penetrated farthest to the north. Apparently then, an increase in its tolerance ranges for low temperatures over the tolerances of the group as a whole has been of considerable advantage to it, and other species, lacking such variability, have been kept farther to the south. *A. bohartorum,* a northern affiliate of the southern California *A. californicus,* has managed to penetrate the coastal fog belt into northern California, in an environment much ameliorated over that which prevails a short distance inland, where low temperatures would presumably prove restrictive to it.

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